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Two new species of *Spiniphallellus* Bidzilya & Karsholt, 2008 (Lepidoptera, Gelechiidae) from Afghanistan and Iran

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Abstract. *Spiniphallelus eberti* **sp. nov.** (Iran) and *Spiniphallellus naumanni* **sp. nov.** (Afghanistan) are described. The position of the genus within the subfamily Anomologinae is briefly discussed, as is the degree of development of the gnathos in the male genitalia of two species within the same genus. A key to all *Spiniphallellus* species is given, and adults and male and female genitalia of the new species are illustrated.

Introduction

The genus *Spiniphallellus* was established for three species of Gelechiidae, respectively from the deserts of Kazakhstan, Uzbekistan and Turkmenistan (*S. desertus* Bidzilya & Karsholt, 2008), mountains of Kazakhstan (*S. stonisi* Bidzilya & Karsholt, 2008) and mountains of Turkey (*S. fuscescens* Bidzilya & Karsholt, 2008). Recently an additional new species, *S. chrysotosella* Junnilainen, 2016, was described from Bulgaria, Turkey and Georgia. The first three species are externally very similar, but can easily be separated by their genitalia. *S. chrysotosella* looks externally quite distinct from the other species both by its wingspan and wing pattern, but its genitalia match well the configuration for the genus, being most similar to those of *S. fuscescens*.

The host plant is known only for *S. desertus*, whose larva feeds on *Rheum* sp. (Polygonaceae) in Kazakhstan (Falkovitsh and Bidzilya 2009). The adults of *S. chrysotosella* were observed around *Jasminum fruticans* L. (Oleaceae) in all three localities where this species was recorded (Junnilainen 2016).

As a result of studying collected material in the Staatliches Museum für Naturkunde in Karlsruhe, five plain coloured, rather narrow-winged greyish black specimens of Gelechiidae were discovered amongst material from Afghanistan and Iran. Their assignment to the genus *Spiniphallellus* was proved by the study of the genitalia. It turned out that they represent two different species, which do not match any known species in the genus. Their description is given below.

Material and methods

Male and female genitalia were dissected and prepared using standard methods. Pinned specimens were photographed with an Olympus E-410 digital camera attached to an Olympus SZX12 micro-

scope. Slide-mounted genitalia were photographed with a Canon EOS 600D digital camera mounted on an Olympus U-CTR30-2 combined with a Carl Zeiss microscope. Sets of 4–7 images were taken of each specimen and montaged using Helicon Focus 6 and edited in Adobe Photoshop CS5. The descriptive terminology of the genitalia structures generally follows Bidzilya and Karsholt (2008) and Huemer and Karsholt (2010).

The type material is deposited in the Staatliches Museum für Naturkunde, Karlsruhe, Germany (SMNK).

Results

Key to *Spiniphallellus* species based on external characters

(*S. fuscescens* and *S. naumanni* can hardly be separated without examination of the genitalia)

1	Forewing with shining golden spots, wingspan 9–9.5 mm	***S. chrysotosella***
–	Forewing without golden spots, wingspan 14–18 mm	**2**
2	Hindwing at ¾ length distinctly narrower than at base	***S. eberti***
–	Hindwing at ¾ length about as wide as at base	**3**
3	Forewing light grey, brown irroration indistinct	***S. desertus***
–	Forewing dark greyish black, brown irroration well developed	**4**
4	Black stigmata in the forewing distinct	***S. stonisi***
–	Black stigmata in the forewing indistinct	***S. fuscescens, S. naumanni***

Key to *Spiniphallellus* species based on male genitalia

1	Gnathos present	***S. eberti***
–	Gnathos absent	**2**
2	Uncus plate arrow-shaped	***S. stonisi***
–	Uncus plate of another shape	**3**
3	Valva 7 times as long as broad	***S. chrysotosella***
–	Valva 1.5–3.5 times as long as broad	**4**
4	Distal part of phallus weakly s-shaped, lateral process absent	***S. naumanni***
–	Distal portion of phallus straight, lateral process present	**5**
5	Valva 3.5 times as long as broad, transtilla lobe slender, digitate	***S. fuscescens***
–	Valva 2 times as long as broad, transtilla lobe broad, rounded	***S. desertus***

Key to *Spiniphallellus* species based on female genitalia

(females of *S. stonisi*, *S. chrysotosella* and *S. naumanni* are unknown)

1	Antrum distinct, funnel-shaped	***S. desertus***
–	Antrum indistinct, rounded or tubular	**2**
2	Antrum rounded, medial sclerites of sternum VIII indistinct, anterior margin weakly sclerotized	***S. fuscescens***
–	Antrum tubular, medial sclerites of sternum VIII distinct, anterior margin strongly sclerotized	***S. eberti***

Description of new species

Spiniphallellus eberti sp. nov.

http://zoobank.org/26EBA944-A295-4D13-B40B-31E8C64A4A8F

Type material. Holotype ♂, W Iran, Kordestan, Strasse Baneh-Marivan, 86 km SE Baneh, 1950 m, 5.vii.1975 (Ebert & Falkner) (genitalia slide 64/17, O. Bidzilya) (SMNK). Paratypes: 2 ♂, 1 ♀, same data as for holotype (genitalia slide 55/17♂; 60/17♀, O. Bidzilya) (SMNK).

Diagnosis. The new species is characterized superficially by a greyish brown forewing with black markings. It can be separated from its congeners by the hindwing which is distally more narrowed. The male genitalia are unique in having a short and broad valva with a lateral process and well developed distal triangular sclerite of the gnathos. The female genitalia are defined by the presence of distinct medial sclerites on sternum VIII, strongly sclerotized anterior margin of segment VIII and a long anterior apophysis. *S. fuscescens* differs in the weaker sclerotized anterior margin of sternum VIII, the shorter posterior apophysis, less distinct medial sclerites and a rounded rather than tubular antrum.

Description. ***Adult*** (Figs 1–3). Wingspan 15–17 mm. Head, thorax and tegulae covered with grey scales with light brown tips, labial palpus greyish brown, segment 2 twice as broad and slightly longer than segment 3, lower surface with short brush of modified scales, apex and upper surface light grey, scape grey with pale apex, flagellum ringed black and grey; forewing narrow, pale greyish brown, with indistinct black spots at base and in middle, sub-costal vein mottled with grey, light grey sub-apical transverse fascia at ¾ wing length, cilia grey. Hindwing covered with grey, brown-tipped scales, medial third pale grey, distinctly narrowed from base to ¾ length of wing.

Variation. The female is more unicolorous brown, and the grey pattern on the subcostal vein and sub-apical fascia are not developed.

Male genitalia (Figs 5, 6). Uncus broadly rounded, posterior margin with long setae; distal sclerite of gnathos short, triangular, strongly edged; tegumen broader than long in middle, anteromedial emargination trapezoidal, about 1/3 length of tegumen; valva about 1.5 times as long as broad, strongly sclerotized, with distinct lateral process, posterior margin weakly serrated and thickened, densely setose, extending to the top of uncus; transtilla lobes reduced; vinculum 2.5 times as broad as long, posterior margin broadly emarginated with narrow drop-shaped medial incision; saccus twice as broad as long, narrowed at base, anterior margin broadly rounded. Caecum as long and twice as wide as phallus, rounded, distal part of phallus gradually narrowing towards rounded apex, lateromedial process thorn-shaped.

Female genitalia (Fig. 7). Papilla analis sub-ovate, densely covered with short setae; posterior apophysis as long as the length of ductus bursae; anterior apophysis twice as long as segment VIII; sternum VIII sub-rectangular, slightly broader than long, anterior margin strongly sclerotized, paired narrow ribbon-like gradually curved sclerite extending from posterolateral corner of sternum VIII to sub-rhomboid ostium; antrum short, tubular, as broad as ductus bursae, strongly sclerotized laterally; ductus bursae long, nearly of equal width; corpus bursae sub-oval, elongated; signum a sub-oval plate with serrated margins and transverse medial ridge, near the entrance of corpus bursae.

Figures 1–4. Adults of *Spiniphallellus* spp. **1–3.** *S. eberti* sp. nov. **1.** Holotype (genitalia slide 64/17, O. Bidzilya). **2.** Paratype, ♂ (genitalia slide 55/17, O. Bidzilya). **3.** Paratype, ♀ (genitalia slide 60/17, O. Bidzilya). **4.** *S. naumanni* sp. nov., holotype (genitalia slide 46/17, O. Bidzilya).

Biology. Host plant unknown. Adults have been collected in early July at an elevation of about 2000 m.

Distribution. Iran.

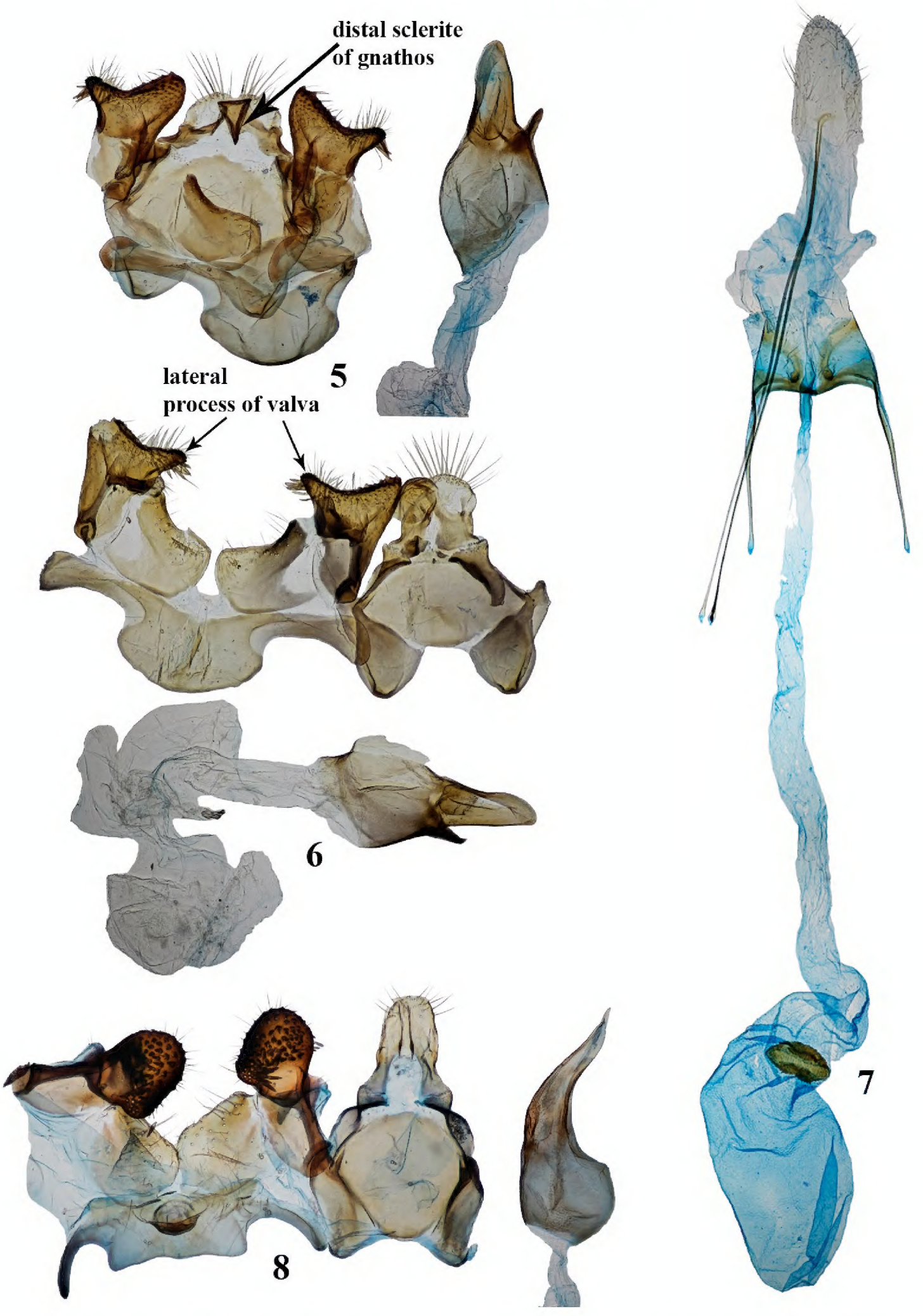
Etymology. The new species is named after one of its collectors, Günter Ebert, who collected a huge amount of material of Lepidoptera, including Gelechiidae, in Iran and Afghanistan.

Spiniphallellus naumanni sp. nov.

http://zoobank.org/18845647-6057-43B3-AEB4-E3BC9D25C5F7

Type material. Holotype ♂, NO Afghanistan, Wakhan-Tal, 3450 m, Darrah-e-Shaur, 25.vii.1971, UV-Li.[ght], coll. Nr. 263 (Ebert & Naumann) (genitalia slide 46/17, O. Bidzilya) (SMNK).

Diagnosis. The new species can hardly be recognized externally without examination of the genitalia. The male genitalia are characterized by a rounded valva densely covered with short, strong setae, very short and broad saccus and phallus with narrow weakly s-curved distal portion and reduced lateral process.



Figures 5–8. Genitalia of *Spiniphallellus*. **5–7.** *Spiniphallellus eberti* sp. nov. **5, 6.** Male genitalia. **5.** Holotype (genitalia slide 64/17, O. Bidzilya). **6.** Paratype, unrolled (genitalia slide 55/17, O. Bidzilya). **7.** Female genitalia (genitalia slide 60/17, O. Bidzilya). **8.** *S. naumanni* sp. nov., male genitalia, holotype, unrolled (genitalia slide 46/17, O. Bidzilya).

Description. ***Adult*** (Fig. 4). Wingspan 15 mm. Head, thorax, tegulae and labial palpus black, segment 2 twice as broad and slightly longer than segment 3; forewing narrow, plain greyish-brown, with diffuse light brown costal spot at ¾ wing length, cilia grey. Hindwing light grey.

Male genitalia (Fig. 8). Uncus three times as long as broad, posterior margin weakly rounded, covered with long setae; gnathos reduced; tegumen as broad as long in middle, anteromedial emargination very short; valva rounded, extending to about the tip of uncus, anterolaterally covered with strong setae; transtilla lobes reduced; vinculum 2.5 times broader than long, posterior margin broadly emarginated with very narrow medial incision; saccus four times as broad as long. Caecum rounded, distal part of phallus twice as long as caecum, weakly s-curved and gradually narrowed towards pointed apex, without lateral process.

Female genitalia. Unknown.

Biology. Host plant unknown. The holotype was collected in late July at an elevation of about 3500 m.

Distribution. Afghanistan.

Etymology. The new species is named in the honour of one of its collectors, the late Clas M. Naumann, a famous German lepidopterist.

Note. The holotype is rather greasy, a situation often seen in other specimens of *Spiniphallellus* (Bidzilya and Karsholt 2008). One can argue that a new species should not be based on a single, greasy holotype. Even if the holotype had been in perfect condition it would probably have added little to the diagnosis of this species. As mentioned above most *Spiniphallellus* species are externally similar, with the diagnostic characters being found in the structures of the genitalia. The male genitalia of *S. naumanni* sp. nov. show some distinct characters which adds to our knowledge of the diversity of the genus. A further argument for describing this species is that it is very unlikely that additional material will become available in the foreseeable future, if the distribution of *S. naumanni* is restricted to the high mountains of Afghanistan.

Discussion

The genus *Spiniphallellus* was placed in Anomologinae based on the general similarity of the male genitalia characters, such as sternum VIII and tergum VIII separate, tendency to reduction of gnathos and short valvae covered with hairs. Within the subfamily the genus was provisionally associated with a group of genera related to *Monochroa* Heinemann, 1870, namely *Eulamprotes* Bradley, 1971, *Metzneria* Zeller, 1839, *Ptocheuusa* Heinemann, 1870 and *Isophrictis* Meyrick, 1917 (Bidzilya and Karsholt 2008). However, it was noted that the phallus without cornuti and a well developed uncus of *Spiniphallellus* are not characteristic for the above group of genera. The discovery of a distinct distal sclerite of the gnathos in *S. eberti* sp. nov. indicates that *Spiniphallellus* is less related to *Monochroa* and other related genera than was initially argued. The position of the genus within Anomologinae remains rather unclear and may be clarified in the context of a global revision of this subfamily with the application of data obtained from the DNA-studies. Only a DNA barcode for *S. chrysotosella* (cluster number BOLD:ACW1628) is yet available whose placement is uninformative.

In the original description of *Spiniphallellus* it is stated that the gnathos of the male genitalia is absent. However, a gnathos is at least to some extent present in all species of the genus, but in different stages of reduction. This is true for *S. naumanni*, which has a reduced distal sclerite

of gnathos, whereas the male genitalia of *S. eberti* have a short, triangular, strongly edged distal sclerite of the gnathos. In most Lepidoptera families the presence or absence of a gnathos would be considered as a character important at genus level, but several genera of Gelechiidae (especially within the Anomologinae and the Litini) show a tendency to reduction of the gnathos and sometimes also the uncus. Based on other characters *S. eberti* fits well into *Spiniphallellus*. The species of *Spiniphallellus* vary also in the degree of development of transtilla lobes. This character is represented by slender or broad medially projecting processes in *S. desertus*, *S. fuscescens* and *S. chrysotosella*. The transtilla lobes are reduced in *S. stonisi* and both species described here.

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